

nitive processing independent of simple motor response was found when PD patients were divided into early vs. late age of onset. Patients who developed PD later in life had significantly greater slope over set size than either early onset PD patients or controls indicating slower speed of cognitive processing. The results provide further evidence for a dissociation of cognitive deficits between PD patients with early vs. late age of onset.

**B. SKA & J.-L. NESPOULOUS:** Human Figure and Bicycle Drawings by Normal Aged Subjects and Alzheimer Type Patients. Human figures and bicycles were drawn by normal aged subjects ( $N=88$ ), Alzheimer type patients ( $N=12$ ) and normal younger adults ( $N=60$ ). The scoring implied three criteria: (a) presence/absence of elements; (b) proportions of the elements, and (c) organization of the elements. The results indicate that drawings executed by normal aged subjects are simplified when compared with drawings by younger adults, i.e., the latter draw more elements. The drawings executed by the Alzheimer type patients are even more simplified than those of normal aged subjects. The results also indicate problems with the organization of elements. These results lead to definition of several types of relations between the elements in a drawing: iden-

tical, logical, functional, metrical, and mechanical. The normal aged group's drawings show problems with representation of the functional, metrical, and mechanical relations, whereas the Alzheimer type patients show problems with all five types of relations.

**C. JUNQUÉ, A. PEIRÓ, P. VENDRELL, J.**

**VAZQUEZ, J. M. GRAU, and L. BARRAQUER:** Speed Retrieval of Short-Term Memory in Parkinson Disease.

We studied the Sternberg paradigm to investigate short-term memory in relation to speed in twenty PD and in matched controls.

Results were compared with a control group. Analysis of variance showed significant differences in IQ between the groups. Correlations were seen in Logical Memory, Associative Learning, and Visual Retention. However, no differences were obtained in the Digit Span subtest. Differences between (VIQ-MQ) formula were also obtained for the two groups. Speed retrieval: Regression lines in both groups obtained from the Sternberg paradigm using the least squares showed similar slopes. The intercept on the Y axis was higher for PD than in controls.

**M. GUERREIRO and C. GARCIA:** Patterns of Psychological Defect in Alzheimer's Disease. Fifty-one patients with the diagnosis of Alzheimer's disease were submitted to a battery of 15

qualitative analysis of the results of psychological assessment, three patterns of psychological profile emerged. The authors admit that there are different patterns of evolution of mental defect in Alzheimer's disease which are independent of the two variables "age of onset" and "duration of illness" since no correlation was found between these two variables and any one of the three psychological profiles.

**I. GRANT, J. H. ATKINSON, C. KENNEDY, J. A. McCUTCHAN, D. D. RICHMAN, and S. A. SPECTOR:** Neuropsychological Findings in HIV Infection: Relation to Seropositivity and Treatment with Azidothymidine. Two studies were conducted to determine the neuropsychological (NP) correlates of infection with human immunodeficiency virus (HIV). In study 1, homosexual men whose sexual practices placed them at risk for contracting HIV were divided into those who were antibody positive ( $N=34$ ) and those who were HIV negative ( $N=26$ ). All subjects were ambulatory and none had gross neurological signs. HIV-positive individuals performed significantly worse on category test, story learning, trail making, and paced auditory serial addition (PASAT). In study 2, 24 subjects who represented our center's participants in a multicenter placebo controlled trial of the antiviral agent azidothymidine (AZT) were compared on NP tests after 3 to 6 months of therapy. There were no NP differences between AZT and placebo. We conclude that HIV infection increases risk of NP deficit; preliminary data do not suggest NP improvement from AZT.

**N. B. LINCOLN and D. TINSON:** The Relation Between Objective and Subjective Memory Impairment After Stroke. The aim of the study was to examine the relationship between subjective memory impairment and objective memory impairment in stroke patients. The subjects were asked to complete a question-naire about memory problems in daily life. Their relatives completed the same questionnaire. Correlations between the RBMT and the reports of both relatives and patients were highly significant indicating that memory questionnaires are likely to be valid indications of real-life memory skills.

**TH. BENKE, S. PLÖRER, and F. GERSTENBRAND:** Visual Agnosia and Memory Loss. The behaviour of a patient with a visual associative-agnosia and with a persisting amnesic syndrome is analyzed. Elementary perception and integration of visual stimuli was intact. Faulty object recognition was caused by a weakening of inter-modality association, and also of visuo-semantic processings. Agnosia was accompanied by pure

agnosia and a loss of mental imagery. Contrary to comparable case reports of visual agnosia, our patient's symptoms were caused by a single posterior left-hemisphere lesion. Memory testing indicated poor learning abilities for all modalities, but also evidence for a defective visual short-term memory. Our observations are discussed with regard to a causal relationship between a specific amnesia and impaired visual-object recognition.

**R. I. NAUGLE: Verbal "Contamination" on Recall of Visual Memory Stimuli.** One of the most common techniques used to assess visual memory, that of reproducing simple line drawings, has been repeatedly criticized on the basis that the procedure draws more on verbal than visual memory ability. The WMS has been regarded by some to be an entirely verbal memory measure. This paper presents the results of an investigation of "verbal memory contamination" in the recall of items presumed to tap visual memory. To investigate this, 12 line drawings of varying complexity were presented to 20 individuals who were requested to describe those designs in as few words as possible. These descriptions were used to quantify the "verbalizability" of the designs and to develop a scoring system for evaluating attempts to reproduce them. A subset of four of those designs (selected on the basis of their verbalizability scores) was presented to a second sample of 20 individuals with no known neurologic history. These subjects were asked to reproduce the designs immediately after presentation and following an unannounced 30-min delay. Their reproductions on immediate recall and following the delay were scored according to the criteria derived from the first sample. The results revealed that those designs which were most readily verbalized were most easily recalled. Implications for memory assessment in general and the rehabilitation of memory-impaired individuals are discussed.

**E. WITTLIEB-VERPOORT and E. PERRET: Continuous Memory Performance in Brain-Damaged and Control Subjects.** The margin of subvocal rehearsal was studied in 12 nonselected brain-damaged and 14 control subjects with three different sequential tasks. Series of letters were presented binaurally via headphones and subjects were asked to repeat the immediately preceding string of letters after the presentation of the new string either in order of presentation, in reverse or alphabetical order. In contrast to control subjects, patients' memory performance deteriorated when the number of items to be stored in competing memory loops increased from 2 to 3 letters. Correspondingly, only patients exhibited significantly decreased letter reproduction in

city and their flexibility to simultaneously process information in separate rehearsal loops were reduced.

**J. GRAFMAN, B. JONAS, A. MARTIN, A. SALAZAR, and H. WEINGARTNER: Fragility of Information Retrieval Following Brain-injury: Effects of Recency of Acquisition and Contextual Use.** We tested the hypothesis that context and recency of learning were distinct processes of memory that were differentially sensitive to disruption by brain lesions. We tested 65 controls and 119 patients who suffered penetrating missile wounds to the brain while serving in Vietnam. Tests included Category and Letter Fluency, Naming, Vocabulary Knowledge, Token Test, Famous Faces Test, Levels of Encoding, and Paired-Associates. Patients were divided according to side, lobe, and side by lobe (e.g., left frontal) of involvement. Patients with left-hemisphere lesions were significantly impaired on tasks that required semantic/contextual encoding of related verbal information. Patients with right frontal lesions were significantly impaired on tasks requiring retrieval of episodic but pictorially presented information. Patients with left frontal lesions were relatively more impaired on the Paired-Associates task but patients with left temporal lesions were relatively more impaired on the Levels of Encoding task. There were no dissociations suggesting that old and new knowledge were differentially represented in the nervous system. The most interesting findings indicate the importance of memory processes required to encode information for semantic/contextual relatedness whereas phonological/neutral encoding was more resistant to brain lesions.

**I. LITVAN, J. GRAFMAN, P. VENDRELL, J. M. MARTINEZ, C. JUNQUÉ, J. M. VENDRELL, and L. BARRAQUER-BORDAS: Multiple Memory Deficits in Multiple Sclerosis: Exploring the Working Memory System.** Some patients with multiple sclerosis (MS) demonstrate impaired memory. This impairment has not yet been ascribed to a component of a theoretical memory model. We replicated these observations in a study comparing 16 MS patients to matched controls. We found that the MS patients demonstrated significant memory deficits. We then tested the following specific hypotheses that might account for these results: (1) Relatively low intelligence level of patients with MS is associated with impaired long-term memory performance; (2) Patients with MS have both slowed motor performance and "slowness of thought". Slowness of thought could account for less information encoded and reduced rate of retrieval of information; (3) Patients with MS have impaired short-term

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## Program and Abstracts

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